

PHYSICS

1. In LC oscillation if maximum charge on capacitor C is Q_0 then current in circuit, when 50% energy is in capacitor and 50% energy in inductor is

(1) $\frac{Q_0}{2LC}$ (2) $\frac{2Q_0}{LC}$
 (3) $\sqrt{\frac{2Q_0}{LC}}$ (4) $\frac{Q_0}{\sqrt{2LC}}$

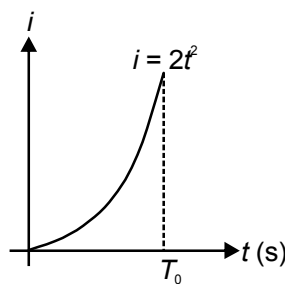
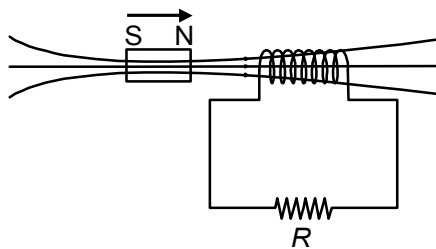
2. A capacitor C is connected across a time varying potential source. If potential across capacitor is changing with rate 1000 V/s at an instant and capacitance C is $3 \mu\text{F}$ then displacement current between two plates of capacitor is

(1) 3 A (2) 0.3 A
 (3) 0.03 A (4) 3 mA

3. Sharpness of LCR series tuning circuit can be improved by

- (1) Decreasing inductance of circuit
 (2) Increasing capacitance of circuit
 (3) Decreasing resistance of circuit
 (4) Keeping inductance and capacitance constant

4. A bar magnet is moving towards inductor coil such that current flowing in circuit varies with time as shown in the figure. The change in the flux through inductor coils in time T_0 second is

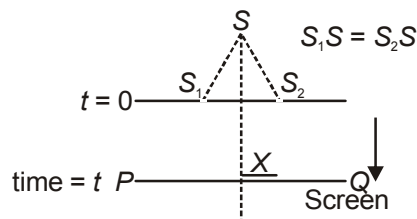


(1) $\frac{3}{2}T_0^2R$ (2) $\frac{3}{2}T_0^3R$
 (3) $\frac{2}{3}T_0^2R$ (4) $\frac{2}{3}T_0^3R$

5. Dip circle plane is initially kept in magnetic meridian and then it is turned by 90° . The magnetic needle in dip circle

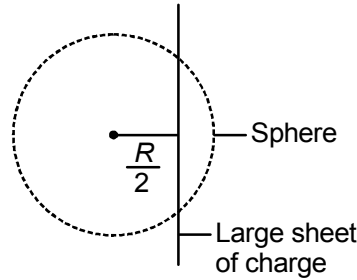
- (1) Becomes horizontal ($0^\circ - 0^\circ$ line)
 (2) Is at 45° with $0^\circ - 0^\circ$ line
 (3) Lies along $90^\circ - 90^\circ$ line (vertical)
 (4) Is at 30° with $0^\circ - 0^\circ$ line

6. A lens of material of refractive index $\mu = 1.6$, is kept in a liquid of refractive index $\mu_m = 1.3$. Then the focal length of lens
- (1) Increases by a factor of 1.6
 - (2) Decreases by a factor of 1.3
 - (3) Decreases by a factor of 2.6
 - (4) Increases by a factor of 2.6
7. Objective lens and eye piece of a telescope have focal length 150 cm and 2 cm respectively. This is used to see a tall tree of height 60 m, 2.4 km away from it. The height of image formed by the objective lens is
- (1) 40 cm
 - (2) 22.5 cm
 - (3) 7.5 cm
 - (4) 3.75 cm
8. In Young's double slit experiment, if instead of monochromatic light a white light is used then central maximum is white and on both side of central maximum first colour visible is
- (1) Red
 - (2) Blue
 - (3) Violet
 - (4) Yellow
9. In Young's double slit experiment screen PQ is initially near slits S_1, S_2 and then it starts free fall as shown. The rate of increase of fringe width at time t second is



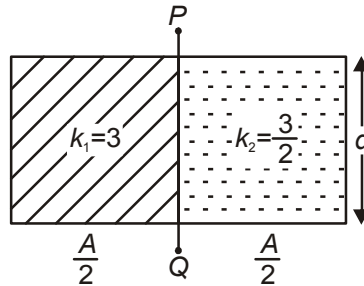
- (1) $\frac{\lambda}{d}gt^2$
 - (2) $\frac{\lambda}{d}gt$
 - (3) $\frac{\lambda}{2d}gt^2$
 - (4) $\frac{\lambda}{2d}t$
10. In a photoelectric experiment cathode is illuminated first by a red colour emitting bulb and then it is replaced by a blue colour emitting bulb both are emitting 100 photons per second, then
- (1) Current in circuit in first case is more than in second case
 - (2) Current in circuit in first case is less than in second case
 - (3) Current in both cases will be same
 - (4) Stopping potential in first case is more than second case
11. Two conducting charged spheres of same material have radii R_1 and R_2 respectively ($R_1 > R_2$). When they are connected by a conducting wire
- (1) Charge must flow from bigger sphere to smaller sphere
 - (2) Charge flows from bigger sphere to smaller sphere if $\frac{Q_1}{R_1} = \frac{Q_2}{R_2}$
 - (3) Potential (in steady state) of bigger sphere will be lesser than potential on smaller sphere
 - (4) Ratio of electric fields on the surface of bigger to that of smaller sphere will be in ratio of $\frac{R_2}{R_1}$

12. An infinitely large plane sheet of charge having surface charge density σ is passing through a sphere of radius R as shown in the figure. The flux passing through the sphere is



- (1) $\frac{3\sigma\pi R^2}{\epsilon_0}$ (2) $\frac{3\sigma\pi R^2}{2\epsilon_0}$
 (3) $\frac{3\sigma\pi R^2}{4\epsilon_0}$ (4) $\frac{4\sigma\pi R^2}{3\epsilon_0}$

13. An air cored parallel plate capacitor has capacitance $C_0 = \frac{A\epsilon_0}{d}$. If two dielectrics are kept as shown in figure. The equivalent capacitance between points P and Q is

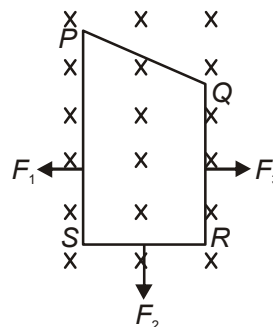


- (1) $\frac{3 A \epsilon_0}{4 d}$ (2) $\frac{5 A \epsilon_0}{4 d}$
 (3) $\frac{A \epsilon_0}{2d}$ (4) $\frac{9 A \epsilon_0}{4 d}$

14. There are large number of capacitors each of capacitance $3 \mu\text{F}$, which can withstand maximum potential of 400 V. A network of capacitors is obtained whose equivalent capacitance is $3 \mu\text{F}$ which can be operated to a main supply of 1 kV. The minimum number of capacitors required is

- (1) 1 (2) 6
 (3) 7 (4) 9

15. A frame of four conducting wire carrying current i is kept in uniform magnetic field B as shown. The magnitude of force acting on segment PQ is equal to

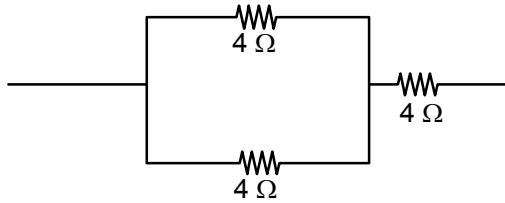


- (1) $\sqrt{(F_1 - F_3) + F_2}$ (2) $(F_1 - F_3)^2 + F_2^2$
 (3) $\sqrt{(F_1 + F_3)^2 + F_2^2}$ (4) $\sqrt{(F_1 - F_3)^2 + F_2^2}$

16. Select correct statement regarding cyclotron.

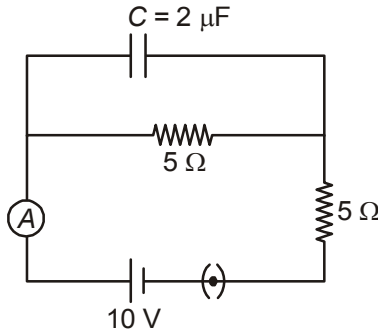
- (1) It cannot accelerate electron because it has negative charge
 (2) During acceleration charged particle displaces perpendicular to plane of dees
 (3) Charged particles are accelerated only in gap
 (4) Charged particles are accelerated throughout its motion

17. There are 3 resistors each of $4\ \Omega$, if maximum power across any one resistor is $16\ \text{W}$, then maximum power develop across 3 resistor will be



- (1) $48\ \text{W}$ (2) $32\ \text{W}$ (3) $24\ \text{W}$ (4) $16\ \text{W}$

18. The reading of ammeter at $t = 0$ and at $t = \infty$ in the circuit shown, is



- (1) $1\ \text{A}, 2\ \text{A}$ (2) $0.5\ \text{A}, 1\ \text{A}$ (3) $1\ \text{A}, 0.5\ \text{A}$ (4) $2\ \text{A}, 1\ \text{A}$

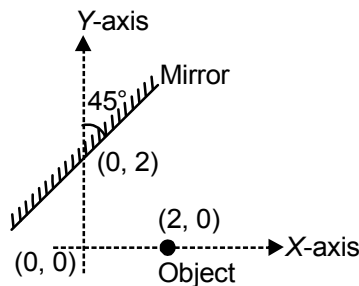
19. A point charge Q is kept r distance away from centre of a conducting sphere of radius R ($R < r$). Then

- (1) Potential due to induced charge on sphere at centre of sphere is zero
 (2) Potential due to induced charge on sphere at any point except centre is zero
 (3) Potential due to induced charge on sphere at any point except centre is non zero
 (4) Both (1) & (3)

20. In Davisson and Germer experiment, intensity of scattered beam of electron is maximum at

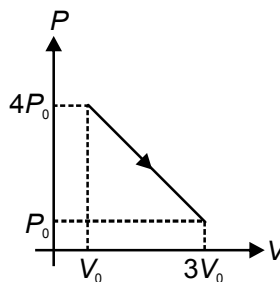
- (1) $50\ \text{V}, 54^\circ$ (2) $54\ \text{V}, 50^\circ$ (3) $50\ \text{V}, 48^\circ$ (4) $48\ \text{V}, 50^\circ$

21. A plane mirror intersect Y-axis at a point $(0, 2)$ and is inclined at 45° from Y-axis. A point object is placed at a point $(2, 0)$ as shown in figure. The image is formed at a point P whose co-ordinate is



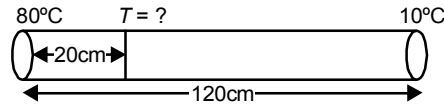
- (1) $(2, 4)$ (2) $(-2, -4)$ (3) $(2, -4)$ (4) $(-2, 4)$

22. Volume of an ideal gas varies with pressure as shown in the diagram. The temperature of gas is maximum at volume



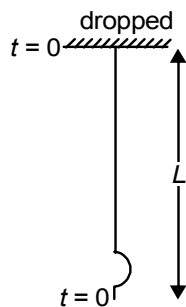
- (1) $\frac{11}{6}V_0$ (2) $\frac{9}{6}V_0$
 (3) $\frac{7}{6}V_0$ (4) $\frac{13}{6}V_0$

23. If mass of each gas molecule in a container is halved and its speed is doubled then pressure exerted by gas molecules on the wall of container increases to a factor of
 (1) 1 (2) 2 (3) 3 (4) 4
24. Heat is flowing through a uniform conductor in steady state. The temperature of a point 20 cm from hot end is

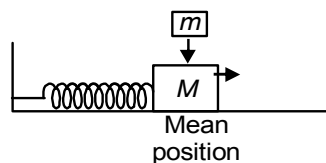


- (1) 62.33°C (2) 64.33°C (3) 68.33°C (4) 72.33°C
25. Which of the following statement regarding variation of gravitational potential inside earth is correct?
 (1) It varies linearly with distance from centre of earth
 (2) Varies hyperbolically with distance from the centre of earth
 (3) Varies parabolically with distance from the centre of earth
 (4) It is independent of distance from the centre of earth
26. A pulse is generated at the lower end of a uniform rope whose one end is attached with the ceiling, and at same time a stone is dropped from the upper end of the rope. The stone crosses wave pulse at X distance from the lower end, then X is

- (1) $\frac{L}{3}$
 (2) $\frac{L}{4}$
 (3) $\frac{2}{5}L$
 (4) $\frac{2}{3}L$

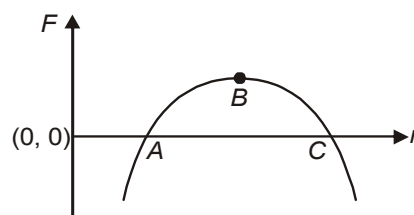


27. Seventeen tuning forks are arranged in ascending frequency order. Any two adjacent tuning forks produce 4 beats per second and fourth tuning fork is octave higher than second tuning fork. The frequency of 13th tuning fork is
 (1) 46 Hz (2) 48 Hz (3) 50 Hz (4) 52 Hz
28. A block of mass M is oscillating with an ideal spring on smooth horizontal surface with amplitude A_0 . A small block (m) is gently dropped on oscillating block while it is passing through mean position (Assume smaller block stick with oscillating block). New amplitude of oscillation is



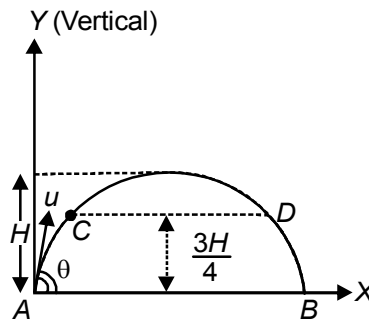
- (1) $A_0 \left[\frac{M}{M+m} \right]$ (2) $A_0 \left[\frac{M}{M+m} \right]^2$ (3) $A_0 \left[\frac{M}{M+m} \right]^{1/2}$ (4) A_0

29. Force acting on a particle in a conservative field is plotted against distance as shown. Select correct statement



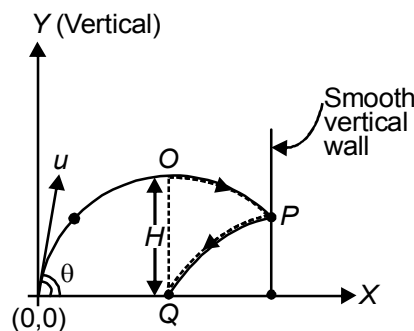
- (1) Point A represents stable equilibrium (2) Point A represents unstable equilibrium
 (3) Point B represents stable equilibrium (4) Point B represents neutral equilibrium

30. A body of mass 12 kg initially is in rest and then explodes into three fragments 2 kg, 4 kg and 6 kg. 2 kg and 4 kg blocks moves along East and North with speed 10 m/s and 5 m/s respectively. The velocity of 6 kg block is
- (1) $\frac{10\sqrt{2}}{3}$ m/s South-West
 - (2) $\frac{10}{3}$ m/s North-West
 - (3) $\frac{10\sqrt{2}}{3}$ m/s North-West
 - (4) $\frac{10}{3}$ m/s South-West
31. A solid sphere is given angular speed ω_0 and then it is kept on horizontal rough surface gently. When sphere starts pure rolling, its angular velocity will be
- (1) $\frac{5}{7}\omega_0$
 - (2) $\frac{4}{7}\omega_0$
 - (3) $\frac{3}{7}\omega_0$
 - (4) $\frac{2}{7}\omega_0$
32. There is a system of particle in which all particles are in state of motion then
- (1) Kinetic energy of system of particles in centre of mass frame is zero
 - (2) Momentum of system of particles in centre of mass frame is maximum
 - (3) Kinetic energy of system of particle in centre of mass frame is minimum
 - (4) Both (1) & (2)
33. A projectile is projected at angle θ with speed u as shown in the figure. The ratio of average speed between AB and CD is



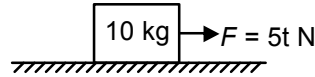
- (1) $\frac{3}{4}$
- (2) $\frac{4}{3}$
- (3) $\frac{4}{1}$
- (4) 1

34. A projectile with smooth surface is thrown as shown in the figure. It strikes a smooth vertical plane and after rebound it finally falls on the ground at a point just below the highest point of the trajectory. Vertical height of point P from the ground is

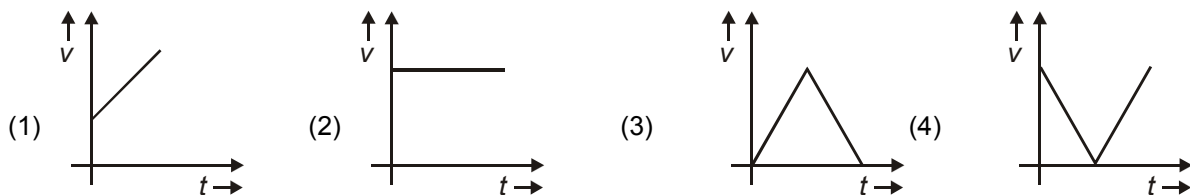


- (1) $\frac{H}{3}$
- (2) $\frac{H}{2}$
- (3) $\frac{2}{3}H$
- (4) $\frac{3}{4}H$

35. A particle is moving in a circular path of radius r such that its speed is decreasing with time. If centripetal acceleration at an instant is $\sqrt{3}$ times tangential acceleration, then angle between velocity and acceleration of the particle at this instant is
 (1) 60° (2) 30° (3) 120° (4) 150°
36. A block of mass 10 kg is kept on rough horizontal surface ($\mu_s = 0.6$). A time varying force acts on it as shown. The friction force on the block at $t = 4$ s is



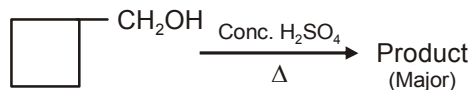
- (1) 20 N (2) 30 N (3) 60 N (4) 40 N
37. A bolt falls from ceiling of an elevator, moving up with acceleration 5 m/s^2 , takes t_1 time to reach the floor. Same bolt takes t_2 time to reach the floor when elevator is going up with retardation 5 m/s^2 . The ratio of t_2 and t_1 is ($g = 10 \text{ m/s}^2$)
 (1) $\sqrt{2}$ (2) $\sqrt{3}$ (3) $2\sqrt{2}$ (4) $\sqrt{5}$
38. A particle is moving along x-axis so that its position is given by $x = (t - 4)^2$ where x is in metre and t in second. The distance travelled by the particle in time interval $t_1 = 1 \text{ s}$ to $t_2 = 8 \text{ s}$ is
 (1) 7 m (2) 12 m (3) 25 m (4) 34 m
39. A particle is moving along x-axis such that its position varies with time as $x = t - \sin 3t$. Velocity of particle lies between
 (1) 0 and -1 m/s for $t > 0$ (2) 2 m/s and -2 m/s for $t > 0$
 (3) 3 m/s and -1 m/s for $t > 0$ (4) 4 m/s and -2 m/s for $t > 0$
40. Car A is moving with speed 20 m/s 30° north of east and car B is moving with speed 10 m/s towards east. The magnitude velocity of car A as observed from car B is ($\sqrt{3} = 1.7$) nearly equal to
 (1) 17.2 m/s (2) 15.3 m/s (3) 12.2 m/s (4) 9.2 m/s
41. Which of the following is not dimensionless?
 (1) Stress (2) Strain (3) Relative permeability (4) Angle
42. If a particle has initial velocity 22.5 m/s and constant deceleration of 3 m/s^2 then displacement of the particle in 8^{th} second of its motion is
 (1) 0 m (2) 1 m (3) 2 m (4) 3 m
43. Which of the following is not equal to 1 joule?
 (1) $1 \text{ watt} \times 1 \text{ second}$ (2) $1 \text{ volt} \times 1 \text{ coulomb}$
 (3) $1 \text{ newton} \times 1 \text{ metre}$ (4) $1 \text{ ampere} \times 1 \text{ second}$
44. Which of the following has dimensions different from others?
 (1) Angular impulse (2) Angular momentum (3) Planck's constant (4) Boltzmann constant
45. From a tower two particles are projected simultaneously, one vertically upward and other just dropped. Which graph correctly represents the variation of relative velocity between two particles before any one of them hits ground?

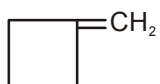
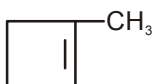




CHEMISTRY

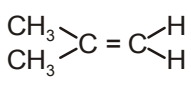
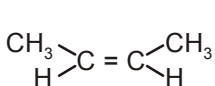
46. How many cyclic structural isomers are possible for the compound with molecular formula C_4H_8O ?
 (1) 4 (2) 6
 (3) 10 (4) 9

47. Predict the major product in the following dehydration process:



- (1)  (2) 
 (3)  (4) 

48. Which of the following alkenes have the lowest heat of combustion?

- (1) $CH_3 - CH = CH_2$ (2) $CH_2 = CH_2$
 (3)  (4) 

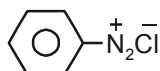
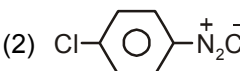


49. The violet coloured complex for the testing of sulphur by Lassaigne's test by adding sodium nitroprusside is due to the formation of

- (1) $Fe_4[Fe(CN)_6]_3$ (2) $Na_4[Fe(CN)_5NOS]$
 (3) $Na_4[Fe(CN)_6]$ (4) $Na_2[Fe(CN)_5(NO)]$

50. Which of the following is the most acidic?

- (1) CH_3COOH (2) $CH_2 = CH - COOH$
 (3) $CH \equiv C - COOH$ (4) C_6H_5COOH

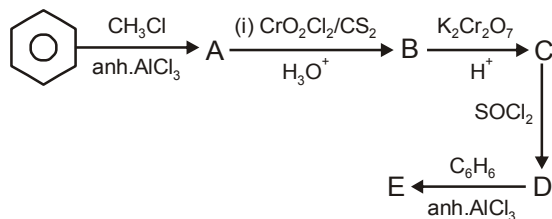
51. Which of the following has the least reactivity in diazo coupling reaction?

- (1)  (2) 
 (3)  (4) 

52. Phenolphthalein is formed by the reaction between

- (1) Phenol and phthalic acid
 (2) Terephthalic acid and ethylene glycol
 (3) Phenol and phthalic anhydride
 (4) Phthalic acid and glycerol

53. Consider the following reaction sequence.



The final product E is

- (1) Aniline (2) Benzophenone
 (3) Chlorobenzene (4) Phenol

54. The correct order of decreasing freezing point for the following solutions is
- (1) $0.05 \text{ M NaCl} > 0.01 \text{ M CaCl}_2 > 0.03 \text{ M AlCl}_3 > 0.05 \text{ M Glucose}$
 - (2) $0.01 \text{ M CaCl}_2 > 0.05 \text{ M Glucose} > 0.05 \text{ M NaCl} > 0.03 \text{ M AlCl}_3$
 - (3) $0.05 \text{ M Glucose} > 0.03 \text{ M AlCl}_3 > 0.01 \text{ M CaCl}_2 > 0.05 \text{ M NaCl}$
 - (4) $0.03 \text{ M AlCl}_3 > 0.05 \text{ M NaCl} > 0.05 \text{ M Glucose} > 0.01 \text{ M CaCl}_2$
55. For which of the following acid-base combinations the enthalpy of neutralization is expected to be the least in magnitude?
- (1) $\text{HNO}_3 + \text{KOH}$ (2) $\text{CH}_3\text{COOH} + \text{NH}_4\text{OH}$
 - (3) $\text{HCl} + \text{Mg}(\text{OH})_2$ (4) $\text{HCOOH} + \text{NaOH}$
56. Which of the following gas is expected to have the largest value of van der Waals constant 'a'?
- (1) CO_2 (2) NH_3
 - (3) CH_4 (4) O_2
57. If the initial concentration of the reactant increases four times, half-life period of the reaction decreases by 64 times. The order of the reaction is
- (1) Zero (2) Two
 - (3) Three (4) Four
58. In which of the following species the average oxidation state of oxygen is -1.2 ?
- (1) KMnO_4 (2) C_3O_2
 - (3) CrO_5 (4) H_2SO_5
59. Which of the following monoxides of group 14 is the most powerful reducing agent?
- (1) CO (2) SiO
 - (3) GeO (4) PbO
60. The hybridization of chlorine in perchlorate ion and the shape of the ion is
- (1) sp^2 , angular (2) sp^3 , tetrahedral
 - (3) sp^3d , see-saw (4) sp^3d^2 , square planar
61. Which of the following species is diamagnetic?
- (1) $[\text{Fe}(\text{CN})_6]^{3-}$ (2) $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
 - (3) $[\text{Co}(\text{NH}_3)_6]^{3+}$ (4) $[\text{Mn}(\text{CN})_6]^{4-}$
62. Which of the following does not liberate oxygen gas at anode on electrolysis? (using inert electrodes)
- (1) 5% H_2SO_4 solution
 - (2) 10% NaBr solution
 - (3) 90% Na_2SO_4 solution
 - (4) 8% AgNO_3 solution
63. Which of the following compounds have maximum solubility in water?
- (1) MgCr_2O_7 (2) CaCr_2O_7
 - (3) SrCr_2O_7 (4) BaCr_2O_7

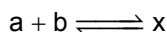
64. Kjeldahl method for estimation of nitrogen is not applicable to
- (1) Pyridine
 - (2) Hexamethylenediamine
 - (3) Propan-1-amine
 - (4) 2-Phenylethanamine
65. A silver coin weighing 10.0 g was dissolved in nitric acid. On adding NaCl to the solution, precipitate of AgCl weighing 10.63 g was obtained. What is the percentage of Ag in the coin?
- (1) 80%
 - (2) 70%
 - (3) 60%
 - (4) 90%

66. Consider the following chemical reaction



Find the mass of concentrated HCl solution, which is 36% HCl by mass, required to produce 5.0 g of Cl_2 .

- (1) 14.3 g
 - (2) 28.6 g
 - (3) 42.9 g
 - (4) 7.1 g
67. Find the value of equilibrium constant at 1000 K, for the following reaction, when ΔG° is -38.3 kJ



- (1) 2
 - (2) 100
 - (3) 10
 - (4) 4
68. 24 g of an alkaline earth metal gives 29.6 g of the nitride. What will be equivalent mass of the metal oxide?
- (1) 20
 - (2) 28
 - (3) 12
 - (4) 24
69. Identify the set containing isoelectronic and isostructural chemical species
- (1) CO, $\text{CN}^{(-)}$, NO
 - (2) $\text{PO}_4^{3(-)}$, $\text{SO}_4^{2(-)}$, $\text{ClO}_4^{(-)}$
 - (3) B_2 , C_2 , N_2
 - (4) $\text{NO}_3^{(-)}$, $\text{CO}_3^{2(-)}$, BCl_3
70. Given that $\lambda_{\text{CH}_3\text{COOH}}^{\text{C}=0.1\text{M}} = 40 \Omega^{-1} \text{cm}^2 \text{eq}^{-1}$ and $\lambda_{\text{CH}_3\text{COOH}}^0 = 400 \Omega^{-1} \text{cm}^2 \text{eq}^{-1}$. What will the pH of the solution at given concentration(c)?
- (1) Zero
 - (2) 1
 - (3) 2
 - (4) 1.3

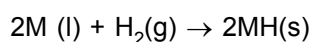
71. If NaCl crystallizes in the same type of lattice as does KCl, then find $\frac{a_{\text{KCl}}}{a_{\text{NaCl}}}$.

Given: $\frac{r_{\text{Na}^{(+)}}}{r_{\text{Cl}^{(-)}}} = 0.6$ and $\frac{r_{\text{Na}^{(+)}}}{r_{\text{K}^{(+)}}} = 0.8$

[a_{KCl} and a_{NaCl} are edge length of KCl and NaCl respectively]

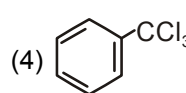
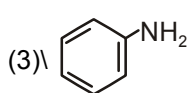
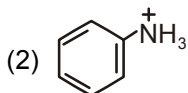
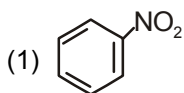
- (1) 1.1
 - (2) 1.3
 - (3) 0.9
 - (4) 1.5
72. 100 g of aqueous solution of sucrose is cooled to -0.6°C . Find the amount of ice separated if the freezing point of the solution is -0.4°C .
- [$K_{\text{f}(\text{H}_2\text{O})} = 1.86 \text{ K mol}^{-1} \text{ kg}$]
- (1) 33.4 g
 - (2) 21.6 g
 - (3) 16.3 g
 - (4) 25.5 g

73. For the coagulation of the positively charged sols, the coagulating power is maximum for
- (1) $\text{Na}_4[\text{Fe}(\text{CN})_6]$ (2) Na_3PO_4
 (3) Na_2SO_4 (4) NaCl
74. Which of the following has maximum boiling point?
- (1) HF (2) H_2O
 (3) CH_4 (4) SbH_3
75. Identify the saline hydride
- (1) B_2H_6 (2) H_2O
 (3) CaH_2 (4) LiAlH_4
76. The saline hydrides are prepared by direct interaction of metal with elemental hydrogen at 300°C to 700°C as


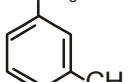
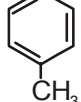


The rates of reaction, are in the order

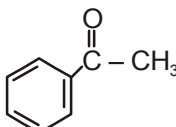
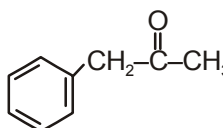
- (1) $\text{Li} > \text{Na} > \text{K} > \text{Cs}$ (2) $\text{Cs} > \text{K} > \text{Na} > \text{Li}$
 (3) $\text{Li} > \text{Cs} > \text{K} > \text{Na}$ (4) $\text{K} > \text{Cs} > \text{Na} > \text{Li}$
77. Identify the chemical reaction in which formation of $\text{N}_2\text{O}(\text{g})$ takes place at 250°C .
- (1) $\text{Cu} + \text{conc. HNO}_3 \rightarrow$ (2) $\text{NH}_4\text{NO}_3 \xrightarrow{\Delta}$
 (3) $\text{NO}_2 + \text{H}_2\text{O} \rightarrow$ (4) $\text{HNO}_3 + \text{P}_2\text{O}_5 \rightarrow$
78. Which of the following is bidentate neutral ligand?
- (1) ox (2) en
 (3) NH_3 (4) H_2O
79. Choose the incorrect statement about $[\text{Ni}(\text{CO})_4]$
- (1) Shape of $[\text{Ni}(\text{CO})_4]$ is tetrahedral
 (2) Bond length of C – O bond is more in $[\text{Ni}(\text{CO})_4]$ than that in carbon monoxide
 (3) There is formation of synergy bond between Ni and CO
 (4) EAN value of Ni, in $[\text{Ni}(\text{CO})_4]$ is 34
80. Which of the following would undergo Friedel Crafts reaction most easily?



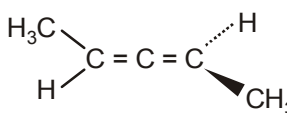
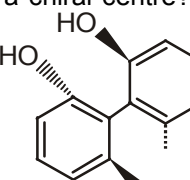
81. Which of the following compound on reductive ozonolysis will give only one type of organic compound?

- (1)  (2) 
 (3)  (4) All of these

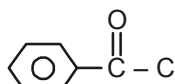



82. Which of the following compound will not show positive iodoform test?

- (1) $\text{CH}_3 - \text{CH}_2 - \text{Br}$ (2) 
 (3)  (4) $\text{CH}_3\text{CH}_2 - \text{C}(=\text{O}) - \text{H}$

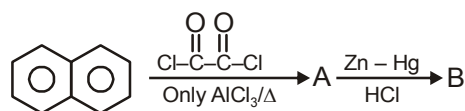
83. Which of these are chiral molecule without a chiral centre?

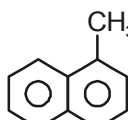
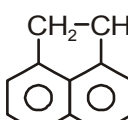
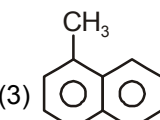
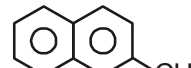
- (1)  (2) 
 (3) Both (1) & (2) (4) None of these

84. The decreasing order of reactivity for hydrolysis reaction for the following compound.

- i.  ii. 
 iii.  iv. 
 (1) $i > ii > iii > iv$ (2) $ii > iv > i > iii$
 (3) $i > iv > iii > ii$ (4) $iv > iii > ii > i$

85. The 'B' product in the following reaction



- (1)  (2)  (3)  (4) 

86. In the following conversion $\text{NO} \longrightarrow \text{NO}^\oplus$

- i. It is an endothermic process
 ii. Bond order increased
 iii. Diamagnetic \longrightarrow Paramagnetic

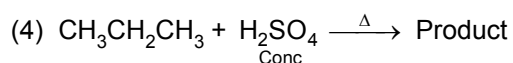
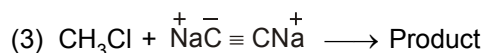
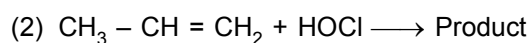
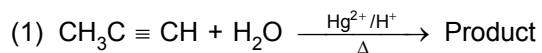
Which of the statements are correct?

- (1) i, ii & iii (2) iii only
 (3) i & ii (4) All are wrong

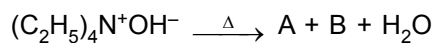
87. Novolac is component of

- (1) Nylon 6 (2) Nylon 6, 6 (3) Bakelite (4) Both 2 and 3

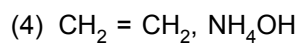
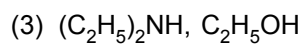
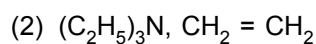
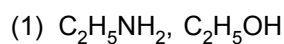
88. Which of the following is a nucleophilic addition reaction?



89. For the reaction,



The products A & B can be:



90. Pick the wrong statement about the conformations in alkane

(1) Higher the Torsional strain, lesser is the stability

(2) Different conformations of an alkane can't be isolated

(3) Rotation around C – C sigma bond is completely free of energy

(4) In n-butane, anti-form is the most stable

BOTANY

91. Match the sites in column I with the processes in column II and choose the correct combination from the options

	Column I		Column II
A.	Grana of chloroplast	1.	Kreb's cycle
B.	Stroma of chloroplast	2.	Light reaction
C.	Cytoplasm	3.	Dark reaction
D.	Mitochondrial matrix	4.	Glycolysis

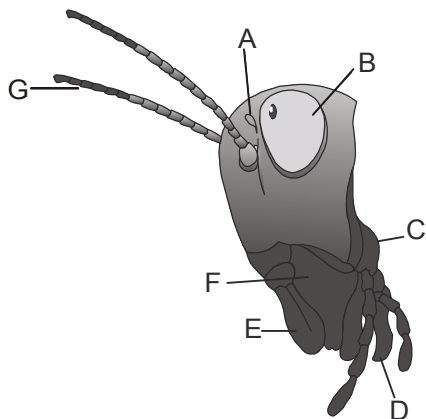
- 1) A-4, B-3, C-2, D-1
 (2) A-1, B-2, C-4, D-3
 (3) A-2, B-1, C-3, D-4
 (4) A-2, B-3, C-4, D-12.
92. Causal organism of red rot of sugarcane is
 1) *Colletotrichum falcatum*
 2) *Colletotrichum candida*
 3) *Puccinia graminis*
 4) *Albugo candida*
93. Link between glycolysis and Kreb's cycle is
 1) Citric acid
 (2) Acetyl CoA
 (3) Succinic acid
 (4) Oxaloacetic acid
94. Keystone species in an ecosystem is defined as the
 1) most abundant species
 2) prominent role determining species
 3) most frequent species
 4) most densely populated species
95. Find the correct statements
 A. Phycoerythrin is the principle pigment of phaeophyceae.
 B. Bryophyta are the amphibians of the plant kingdom.
 C. *Gingko biloba* and *Psilotum* are living fossils.
 D. *Sphagnum* is known as peat moss.
 E. *Gnetum* show umbel like inflorescence
 1) A,B, C
 2) B, D, F
 3) B, C, D
 4) B C, F
96. Aleuroplast is found
 1) Maize
 2) Potato
 3) Mango
 4) Wheat
97. 2,4 D is a derivative of
 1) auxin
 2) gibberellins
 3) ethylene
 4) cytokinin
98. Find the incorrect pair
 1) potato-berry
 2) wheat-caryopsis
 3) coconut-drupe
 4) jackfruit-follicle
99. Dolipore septum is characteristics of
 1) Ascomycetes
 2) Basidiomycetes
 3) Deuteromycetes
 4) Phycomycetes
100. Find the correct pair-
 1) Chipko movement-bishnoi community
 2) First earth summit -1991
 3) Montreal protocol- Italy
 4) Darwins Finches-convergent evolution
101. Exarch radial vascular bundles are found in
 1) roots
 2) monocot stem
 3) dicot stem
 4) all of the above
102. Edible inflorescence are
 1) Mulberry
 2) *Musa*
 3) *Ananas sativus*
 4) all of these

103. Find the correct statements-
- A- Tryptophan is the precursor of auxin
 B- PPP pathway provides precursor for synthesis of aromatic amino acids like phenylalanine
 C- Apical Dominance is shown by Cytokinin
 D- Plastocyanin contains iron as co factor
 E- Dark reaction of photosynthesis occurs in Stroma of Chloroplast
- 1) A, B, C 2) A, B, E 3) B, D, E 4) B,C,D
104. Rough endoplasmic reticulum is the site of
- 1) Lipid synthesis 2) Protein Synthesis
 3) DNA Replication 4) Glucose Synthesis
105. Tyloses occur during fungal infection in the
- 1) Sieve Tubes 2) Companion Cells 3) Vessels 4) Tracheids
106. Find the correct pair
- 1) Phylloclade- Leaf 2) Thorn- Stem 3) Spine- Stem 4) Phyllode- Root
107. "Jaya" is a variety of
- 1) Rice 2) Wheat 3) Bean 4) Sugarcane
108. Allogamy is better than Cleistogamy because it produces
- 1) Clones 2) Variations
 3) Somatic Hybrids 4) No dependence on Pollinators
109. Synaptonemal complex is formed during
- 1) Pachytene 2) Diplotene 3) Diakinesis 4) Zygotene
110. Germplasm theory was given by
- 1) Lamarck 2) Weismann 3) Darwin 4) Hugo de Vries
111. Spindle Fibres are formed due to
- 1) Tubulin Protein 2) Collagen 3) Elastin 4) Fibrin
112. Which is not considered as in situ conservation strategy
- 1) Wild Life Sanctuary 2) Biosphere Reserve 3) National Park 4) Botanical Garden
113. Find the correct statement
- 1) Malvaceae –*Gossypium* 2) Asteraceae- *Lantana*
 3) Euphorbiaceae –*Lycopersicum* 4) Solanaceae- *Azeratum*
114. Balbiani Rings are found in
- 1) Zygotene Chromosome 2) Polytene Chromosome
 3) Lampbrush Chromosome 4) Pachytene Chromosome
115. Photolysis of water requires
- 1) Mg^{2+} 2) Mn^{2+} 3) Fe^{2+} 4) Cu^{2+}
116. In C_4 plants, Calvin cycle occurs in
- (1) Stroma of bundle sheath chloroplast
 (2) Mesophyll chloroplast
 (3) Grana of bundle sheath chloroplast
 (4) Does not occur as CO_2 is fixed mainly by PEP and no CO_2 is left for Calvin cycle
117. The organelles involved in photorespiration are
- 1) Chloroplast, ER, Mitochondria
 2) Chloroplast, mitochondria, peroxisomes
 3) Golgi apparatus, mitochondria, chloroplast
 4) none of these

118. If the number of chromosomes in the root tip is 20 what will be the ploidy in the egg and the endosperm?
 1) 10 and 20 2) 20 and 10 3) 10 and 30 4) 20 and 30
119. Colchicine obtained from *Colchicum autumnale* is used in
 1) medicine 2) plant breeding 3) both (1) & (2) 4) preservatives
120. Beta diversity is
 1) Species diversity 2) Genetic diversity
 3) Within community diversity 4) Between community diversity
121. Match the following pairs correctly and choose the right combination
- | | |
|---------------------------------|---|
| Column-I | Column-II |
| A <i>Escherichia coli</i> | 1. Nif gene |
| B <i>Rhizobium melilotae</i> | 2. Digestive hydrocarbon of crude oil |
| C <i>Bacillus thuringiensis</i> | 3. Production of human insulin |
| D <i>Pseudomonas putida</i> | 4. Biological control of fungal disease |
- Bio-decomposed insecticide
 (1) A = 3, B = 1, C = 5, D = 4
 (2) A = 1, B = 2, C = 3, D = 4
 (3) A = 2, B = 1, C = 3, D = 4
 (4) A = 4, B = 3, C = 1, D = 2
 (5) A = 3, B = 1, C = 5, D = 2
122. Which of the following is correctly matched?
 1) *Agrobacterium tumefaciens* - Tumour
 2) pBR322 -Enzyme
 3) *Thermus aquaticus* -Bt gene
 4) Ligase -molecular scissor
 5) Hind II -Plasmid vector
123. Find the correct ones
 A) Laminarin and mannitol are reserve food material of phaeophyceae
 B) Facilitated diffusion show uphill transport
 C) NH₃ is the first stable product of Atmospheric N₂ fixation by legumes
 D) Fleshy coated seeds with motile gametes is characteristic to Cycadophyta
 E) Dictyota is a red algae
 (1) A, C, E 2) A, B, C 3) A, C, D 4) B, C, E
124. Product of sexual reproduction generates
 1) Viable seeds 2) prolonged dormancy 3) genetic recombination 4) Clones
125. Find the wrong ones
 A) Malvaceae - *Gossypium*
 B) Curcubitaceae - *Citrus*
 C) Brassicaceae - *Lathyrus*
 D) Asteraceae - *Azeratum*
 E) Poaceae - *Cyperus*
 (1) B, C, D 2) A, C, E 3) B, C, E 4) A, D, E
126. ABA and cytokinin is essential for
 1) opening and closing of stomata 2) closing and opening of stomata
 3) Root differentiation 4) shoot differentiation

ZOOLOGY

136. There are four distinctive hallmarks of the phylum chordata, **except**
- (1) Dorsal tubular nerve cord under the notochord
 - (2) A supportive notochord
 - (3) Pharyngeal gill slits for filter feeding
 - (4) Post anal tail for propulsion
137. Which of the following characteristics of phylum chordata is not found in any non-chordate?
- (1) Triploblastic
 - (2) Eucoelom
 - (3) Segmental muscles
 - (4) Ventral heart
138. Choose the **correct** statement
- (1) All chordates are craniates
 - (2) All tetrapods are amniotes
 - (3) All vertebrates are chordates
 - (4) All protochordates have closed blood vascular system
139. Nocturnal, omnivores, resident of human homes, serious pests, vectors of several diseases, live in damp place, chitinous exoskeleton, piercing and sucking type mouth parts.
 How many of the above characters are applicable to *Periplaneta americana*?
- (1) 8
 - (2) 7
 - (3) 4
 - (4) 2
140. Given below is a diagram of the head region of cockroach with certain labelling. Find out the option which include all **correct** labelling



- (1) A – Compound eye B – Ocellus
 - (2) C – Mandible D – Labium
 - (3) E – Labrum F – Maxilla
 - (4) G – Antenna D – Labium
141. Epithelial tissue
- (1) Is avascular
 - (2) Has a free surface
 - (3) Provides a covering or a lining for some part of the body
 - (4) All of these

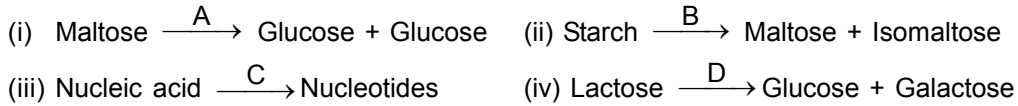
148. Given below is a list of some structures of human respiratory system in a box.

Initial bronchiole, Alveoli, Primary bronchi,
 Secondary bronchi, Trachea, Tertiary bronchi,
 Terminal bronchiole, Respiratory bronchiole

How many of them **do not** possess incomplete cartilaginous rings?

- (1) Two (2) Four
 (3) Five (4) Three

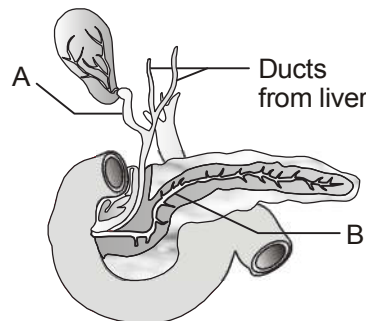
149. Study the following reactions given below catalysed by enzymes A, B, C and D



Choose the option which includes enzymes present in succus entericus

- (1) A & B (2) A & C (3) C & D (4) A & D

150. Given below is a diagrammatic representation of the duct systems of liver, gall bladder and pancreas



If the duct labelled as 'A' and 'B' is blocked then which of the following is **not** affected?

- (1) Concentration of bile and secretion of pancreatic juice
 (2) Synthesis of bile juice and secretion of insulin
 (3) Synthesis of bile juice and release of pancreatic juice
 (4) Concentration of bile juice and release of trypsinogen

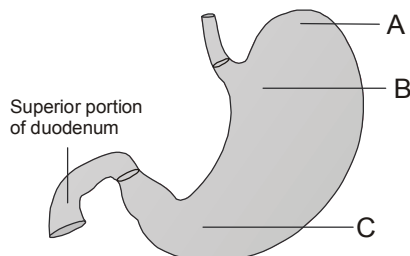
151. Which of the following components of digested food are absorbed by facilitated transport in the presence of carrier ions like Na⁺ from the given list?

- (a) Fructose (b) Glucose (c) Galactose (d) Fatty acid
 (e) Some amino acids

Choose the **correct** option

- (1) (a) only (2) (b) only (3) (a) and (e) only (4) (a) and (c) only

152. Given below is a diagrammatic representation of anatomical regions of human stomach



Choose the **correct** option w.r.t. labelled structure A, B and C

- (1) Oesophagus opens into portion A and its opening is guarded by gastro-oesophageal sphincter
 (2) C opens into duodenum and its opening is guarded by cardiac sphincter
 (3) B portion consists of gastric glands which secretes renin, pepsin and small amount of lipase
 (4) Oesophagus opens into portion B and its opening is guarded by cardiac sphincter

153. Major portion of starch is digested in
- (1) Buccal cavity by ptyalin
 - (2) Duodenum by steapsin
 - (3) Duodenum by amylopsin
 - (4) Buccal cavity by α -amylase
154. Which of the following parts of the kidney is impermeable to water?
- (1) Proximal convoluted tubule
 - (2) Descending limb of loop of Henle
 - (3) Ascending limb of loop of Henle
 - (4) Collecting duct
155. Desert mammals are adapted to water shortage by having nephrons with longer
- (1) Loop of Henle
 - (2) Peritubular capillaries
 - (3) PCT
 - (4) Collecting duct
156. One cannot distinguish between nephrons found in cortical and juxtaglomerular region, on the basis of
- (1) Length of loop of Henle
 - (2) Size and number of nephrons
 - (3) Peritubular capillaries
 - (4) Vasa recta
157. Choose the parameters that control or influence heart rate.
- (a) Sinoatrial node
 - (b) Limbic system
 - (c) Cardio-inhibitory and cardio-accelerating centres in medulla
 - (d) Hormones from thyroid and adrenal glands
- (1) (a) & (d) (2) (a), (c) & (d)
 (3) (c) & (d) (4) (a), (b), (c) & (d)
158. Choose the option that **correctly** fills the blanks (i) and (ii).
- ____(i)____ is blood without its cells and clotting materials, while ____ (ii) ____ is blood without its cells.
- | (i) | (ii) |
|------------|-------------|
| (1) Plasma | Serum |
| (2) Serum | Plasma |
| (3) Lymph | Lymph |
| (4) Lymph | Serum |
159. Mark the **correct** statement.
- (1) In comparing all mammals, we find an inverse relation between heart rate and body size
 - (2) Blood pressure is determined by the cardiac output and the size of veins
 - (3) Heart attack means state of heart when it is not pumping enough blood to meet needs of the body
 - (4) A unique vascular system that exists between the digestive tract, lungs and liver is hepatic portal system
160. A muscle cell is a muscle
- (1) Bundle (2) Fibre
 - (3) Fibril (4) Filament

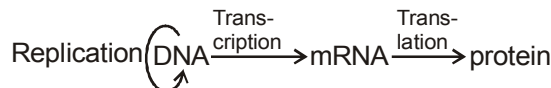
161. Find the **mismatch** between joints and bones mentioned.

- (1) Ellipsoid joint – Atlas and occipital bone
- (2) Gliding joint – Carpals of proximal and distal row
- (3) Pivot joint – Atlas and axis
- (4) Saddle joint – Any carpo-metacarpal joints

162. Progressive degeneration of skeletal muscle mostly due to genetic disorder is

- (1) Muscular dystrophy
- (2) Tetany
- (3) Myasthenia gravis
- (4) Gout

163. The given below central dogma was proposed by -



- (1) Francis Crick (2) Temin and Baltimore
- (3) Friedrich Meischer (4) Beadle and Tatum

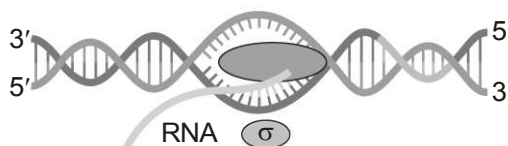
164. Find out **incorrect** statement w.r.t. DNA structure.

- (1) Two polynucleotide chains in a DNA are linked through hydrogen bonds
- (2) Two adjacent nucleotides in each polynucleotide chain of DNA, are linked through 3' - 5' phosphodiester linkage
- (3) Guanine is bonded with cytosine with three hydrogen bonds while adenine forms two hydrogen bonds with 5-methyl uracil.
- (4) The pitch of DNA helix is 34 nm and there are roughly 10 bp in each turn, hence the distance between one bp in a helix is approximately equal to 3.4 nm

165. Find the **correct** statement w.r.t. nucleosome

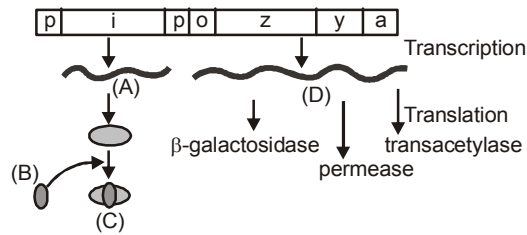
- (1) Seen as string on beads structure in chromatin when viewed under light microscope
- (2) The core of histone molecules is rich in the acidic amino acid residues which carry positive charges in their side chains
- (3) The negatively charged DNA is wrapped around the positively charged histone octamer
- (4) A typical nucleosome contains 400 bp of DNA helix and histone octamer possessing two molecules of each H₁, H₂A, H₂B and H₄

166. Which stage of transcription is occurring in given below diagram?



- (1) Initiation (2) Elongation
- (3) Termination (4) Splicing

167. Study the diagram given below



Choose the **correct** option.

- (1) A – *lac*-mRNA
 B – Inducer
 C – Repressor mRNA
- (2) B – Inducer
 C – *lac*-mRNA
 D – Corepressor
- (3) D – *lac*-mRNA
 A – Inducer
 B – Inactive repressor
- (4) B – Inducer
 C – Inactive repressor
 D – *lac*-mRNA

168. Find out the **correct** match

- (1) Thyroid : Hyperthyroidism causes cretinism in children
- (2) Parathyroid : Secretes parathormone which gland stimulates the movement of calcium from the blood into bones
- (3) Pancreas : Alpha cells secrete insulin hormone
- (4) Adrenal : Secretes catecholamines, medulla adrenaline and non-adrenaline, which 139. Find out the **correct** match
- (1) Thyroid : Hyperthyroidism causes cretinism in children
- (2) Parathyroid : Secretes parathormone which gland stimulates the movement of calcium from the blood into bones
- (3) Pancreas : Alpha cells secrete insulin hormone
- (4) Adrenal : Secretes catecholamines, medulla adrenaline and non-adrenaline, which increases alertness, pupillary dilation and cause piloerection increases alertness, pupillary dilation and cause piloerection

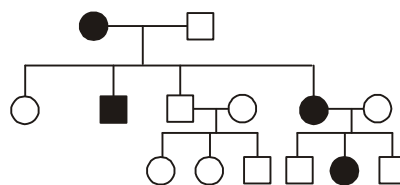
169. Which of the following statement is **incorrect** w.r.t. mechanism of estrogen hormone?

- (1) It will directly pass through the uterine cell membrane and bind with the intracellular receptors in nucleus
- (2) It regulates gene expression by interaction of hormone-receptor complex with genome
- (3) It binds with the membrane bound intracellular receptors in cytoplasm
- (4) No second messenger is required

170. In stomach very few ingested microbes can survive the low pH. This belongs to which of the following barrier?

- (1) Innate physical barrier
- (2) Acquired active immunity
- (3) Acquired passive immunity
- (4) Innate physiological barrier

171. Which of the following may result from a defect in one or more components of the innate or adaptive immunity? Affected individuals are susceptible to diseases that would not bother most people.
- (1) Autoimmune disorder
 - (2) Immunodeficiency disorder
 - (3) Allergy
 - (4) Hypersensitivity
172. To which category of body cells, natural killer cell (NKC) belongs?
- (1) Monocytes
 - (2) Lymphocytes
 - (3) Basophils
 - (4) Eosinophils
173. Mark the disease in which the symptoms are caused by the toxin generated by the bacteria. Therefore, their vaccine are made with weakened or inactive version of the toxin
- (1) Tetanus
 - (2) Diphtheria
 - (3) Dengue
 - (4) Both (1) & (2)
174. Which cannot be considered as special feature of adaptive immunity?
- (1) Specificity
 - (2) Diversity
 - (3) Memory
 - (4) Formation of antigen against antibody
175. The expression of only one of the parental characters in F_1 is not applicable for one gene or two genes interaction showing F_2 progeny with
- A. 2 phenotypes and 3 genotypes w.r.t. plant height in pea.
 - B. 4 phenotypes and 9 genotypes w.r.t. plant height and flower colour in pea.
 - C. 2 phenotypes and 2 genotypes in test cross w.r.t. plant height in pea.
 - D. 3 phenotypes and 3 genotypes w.r.t. flower colour in snapdragon
 - E. 5 phenotypes and 9 genotypes w.r.t. kernel colour in wheat.
- (1) B & D
 - (2) A, D & E
 - (3) D & E
 - (4) B, C & D
176. The given pedigree chart shows the inheritance of

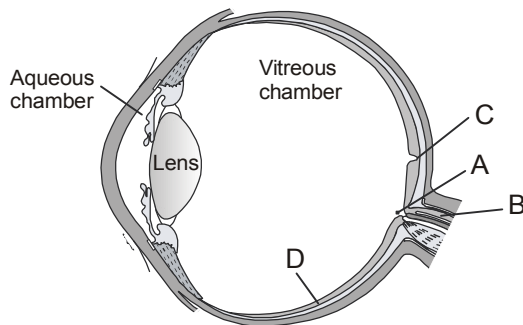


- (1) Colourblindness
 - (2) Myotonic dystrophy
 - (3) Turner's syndrome
 - (4) Haemophilia
177. DNA Fingerprinting involves identifying differences in some specific regions in DNA sequence called
- (1) Palindromic DNA
 - (2) Repetitive DNA
 - (3) Satellite DNA
 - (4) More than one option is correct

178. Statutory ban on amniocentesis is for

- (1) Determination of genetic disorders in the foetus.
- (2) Sex determination to legally check increasing female foeticide.
- (3) Determination of metabolic disorders like phenyl- ketonuria.
- (4) Removal of amniotic fluid surrounding the developing embryo.

179. Following is the diagram of eye with parts labelled as A, B, C and D. Which of the following is the **incorrect** identification of the labelled part with its characteristics/function?



- (1) A – Blind spot, photoreceptors cells are not present in this region, so no image formation
- (2) B – Optic nerve, leaves the eyeball. It formed by the axons of bipolar neurons
- (3) C – Fovea, here only cones are present. It is the point where the resolution is greatest
- (4) D – Retina, contains three layers of cells-from inside to outside-ganglion cells, bipolar cells and photoreceptor cells

180. When one buys packets of cigarettes one cannot miss the statutory warning that is written on the packing which warns against smoking and says how it is injurious to health.

- A. Nicotine in tobacco smoke is an alkaloid and stimulant.
- B. Nicotine stimulates the adrenal gland to release adrenaline and noradrenaline into blood circulation.
- C. Smoking is associated with increased incidence of cancers of lung, urinary bladder and throat.
- D. Smoking increases carbon monoxide content in the blood and reduces the concentration of haembound oxygen.
- E. Nicotine binds with adrenergic receptors.

Choose the option with all **correct** statements.

- (1) B, D and E
- (2) A, D and E
- (3) A, B, C, D and E
- (4) A, B, C and D



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CLASSES

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NEET

16-07-2017(ANSWER KEY)

PHYSICS

1	4	2	4	3	3	4	4	5	3
6	1	7	4	8	1	9	2	10	3
11	4	12	3	13	4	14	4	15	4
16	4	17	3	18	4	19	4	20	2
21	1	22	1	23	2	24	3	25	3
26	4	27	4	28	3	29	2	30	1
31	4	32	3	33	4	34	4	35	3
36	1	37	2	38	3	39	4	40	3
41	1	42	1	43	4	44	4	45	2

CHMISTRY

46	4	47	3	48	3	49	2	50	3
51	4	52	3	53	2	54	2	55	2
56	2	57	4	58	3	59	1	60	2
61	3	62	3	63	1	64	1	65	1
66	2	67	2	68	2	69	2	70	3
71	1	72	1	73	1	74	2	75	3
76	3	77	2	78	2	79	4	80	2
81	1	82	4	83	3	84	2	85	2
86	3	87	3	88	1	89	2	90	3



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BOTANY

91	4	92	1	93	2	94	2	95	3
96	1	97	1	98	4	99	2	100	1
101	1	102	4	103	2	104	2	105	3
106	2	107	1	108	2	109	4	110	2
111	1	112	4	113	1	114	2	115	2
116	1	117	2	118	4	119	3	120	4
121	5	122	1	123	3	124	3	125	3
126	2	127	2	128	2	129	3	130	3
131	3	132	3	133	4	134	1	135	1

ZOOLOGY

136	1	137	4	138	4	139	2	140	4
141	4	142	3	143	2	144	3	145	3
146	3	147	3	148	4	149	4	150	2
151	3	152	4	153	3	154	3	155	1
156	3	157	4	158	2	159	1	160	2
161	4	162	1	163	1	164	4	165	3
166	2	167	4	168	4	169	3	170	4
171	2	172	2	173	4	174	4	175	3
176	2	177	4	178	2	179	2	180	4